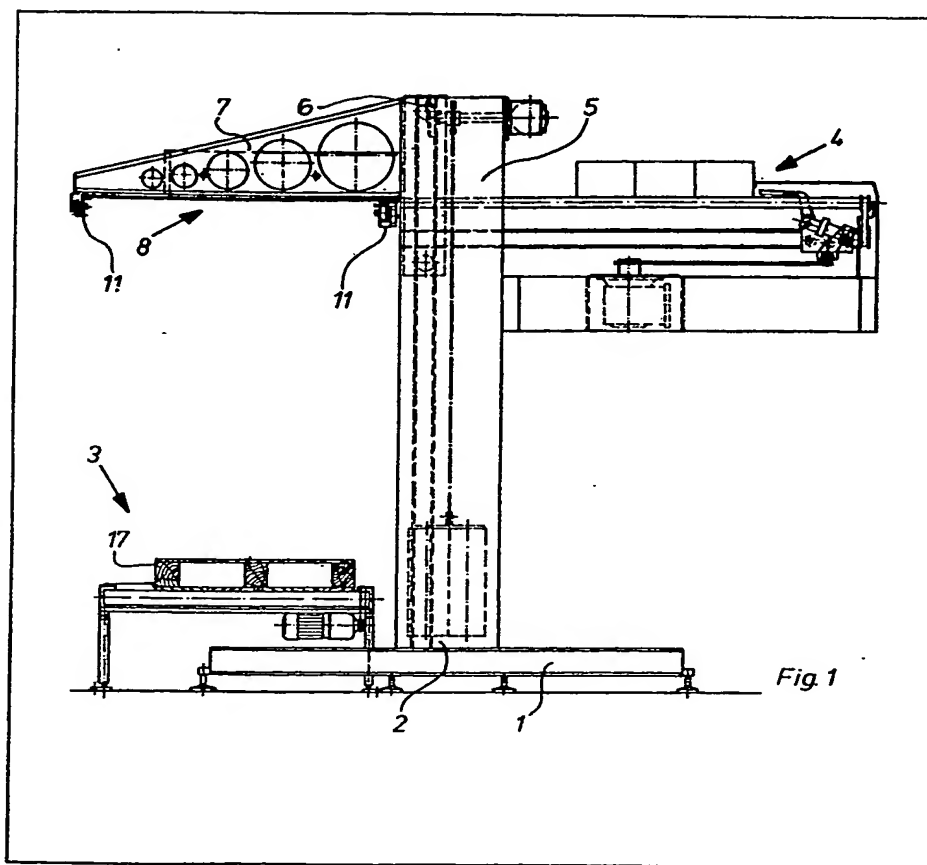


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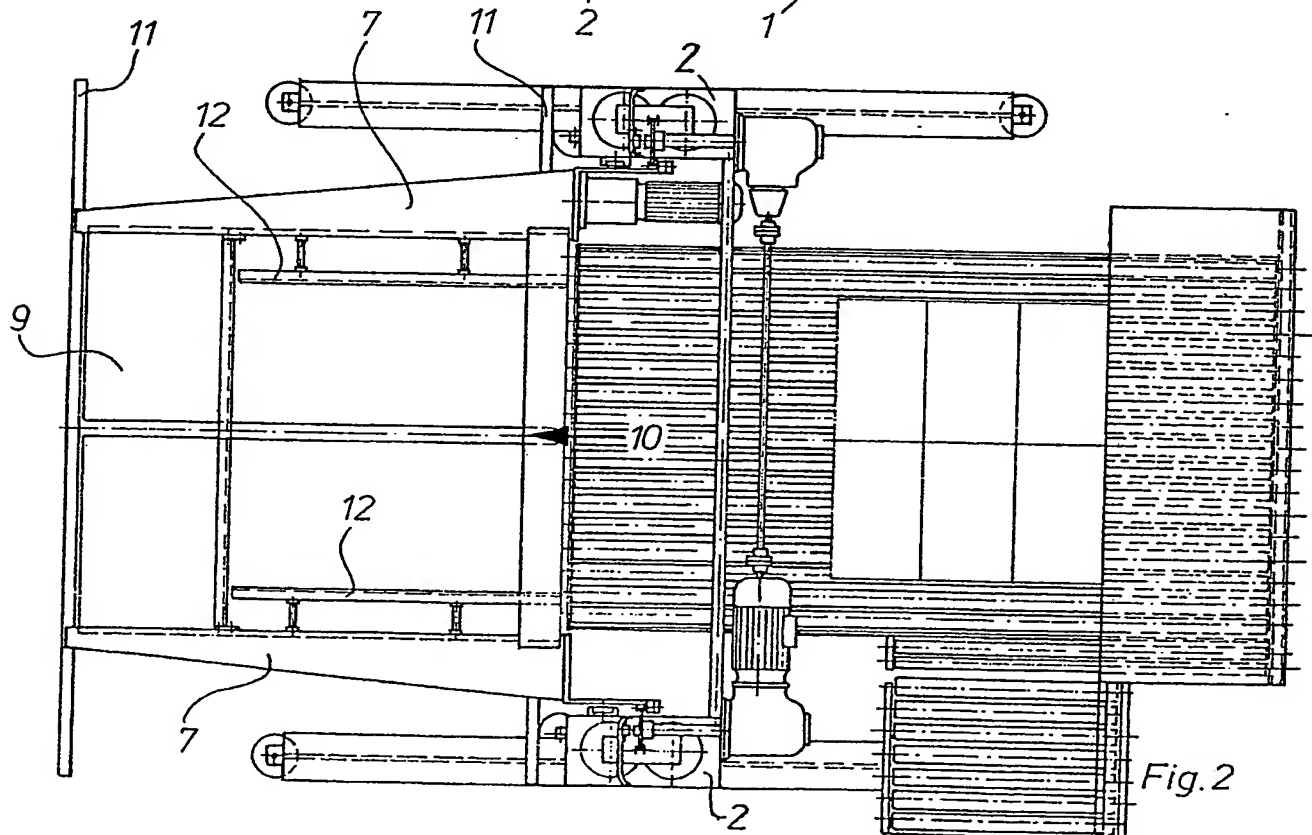
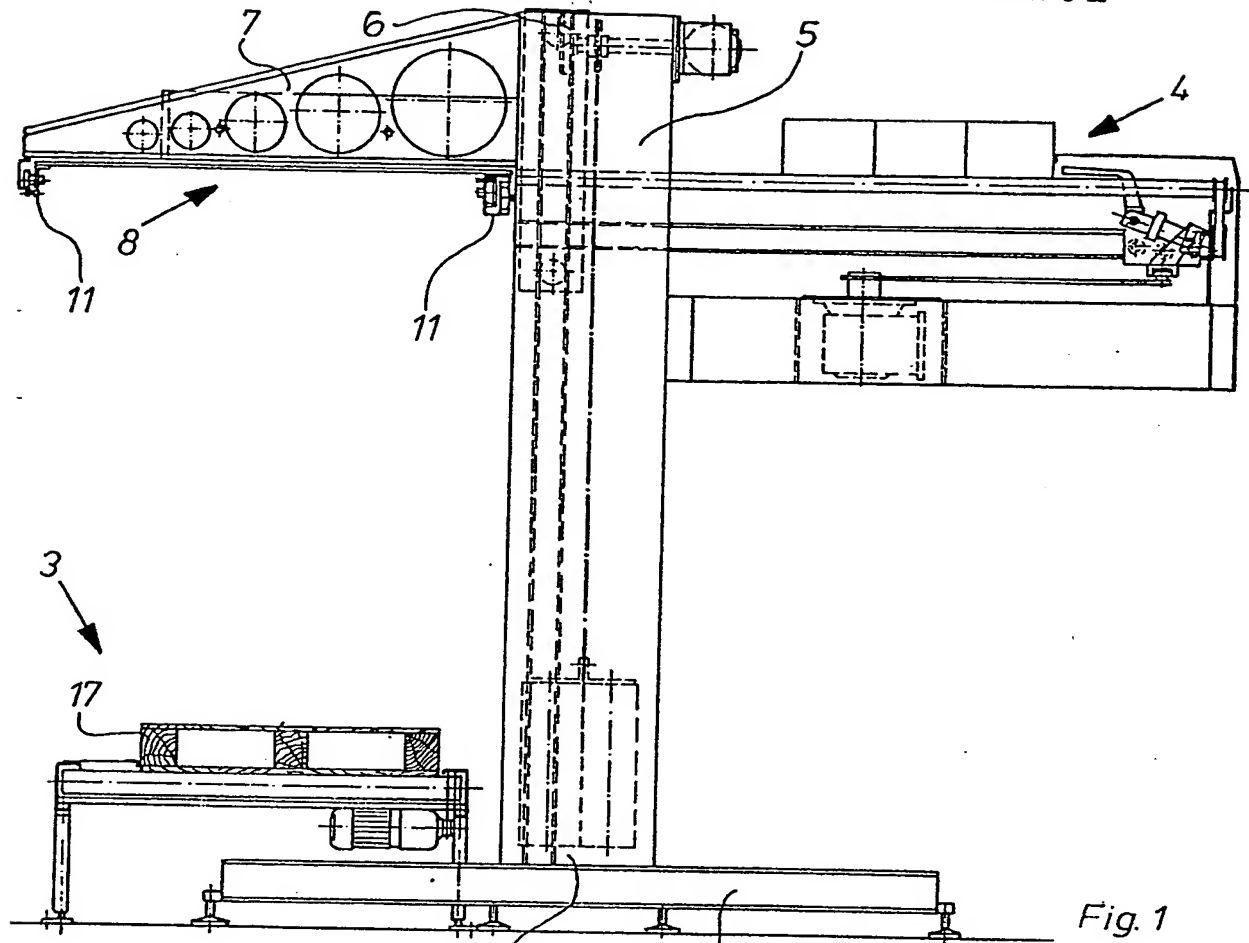
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(54) Apparatus for loading pallets

(57) An apparatus for loading pallets (17) with piece goods comprises a pallet loading position (3), a piece goods collection position (4), a vertically reciprocable support (8) for goods located solely above the pallet loading position (3) and comprising two halves which are guided along each side on support rails (11) extending at right angles to the direction of transfer of the goods onto the support and are displaceable towards and away from one another, and members for stripping goods from said support halves whilst said halves are displaced away from one another.



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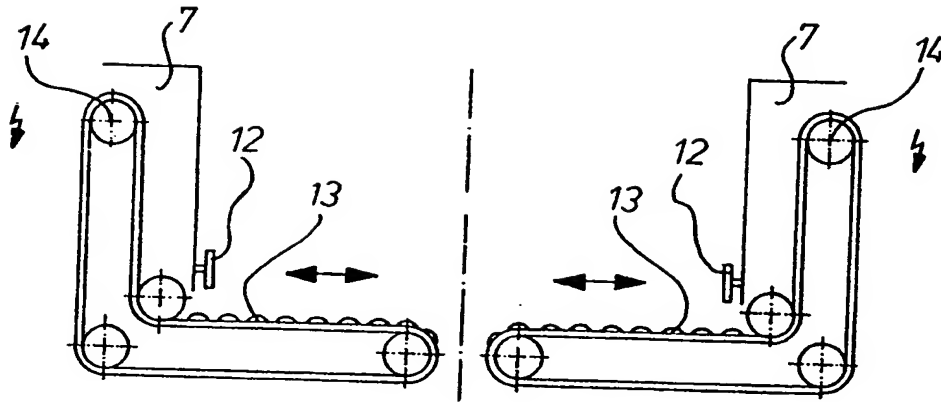


Fig. 3'

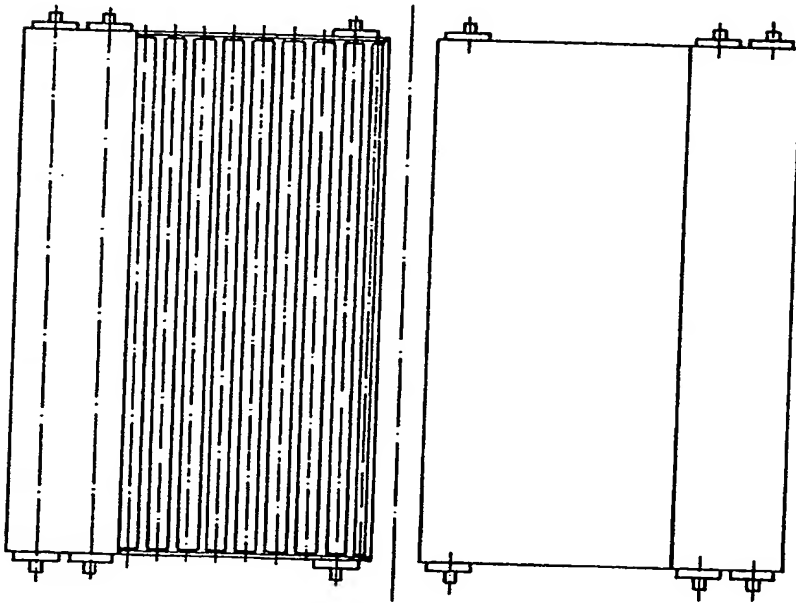


Fig. 3

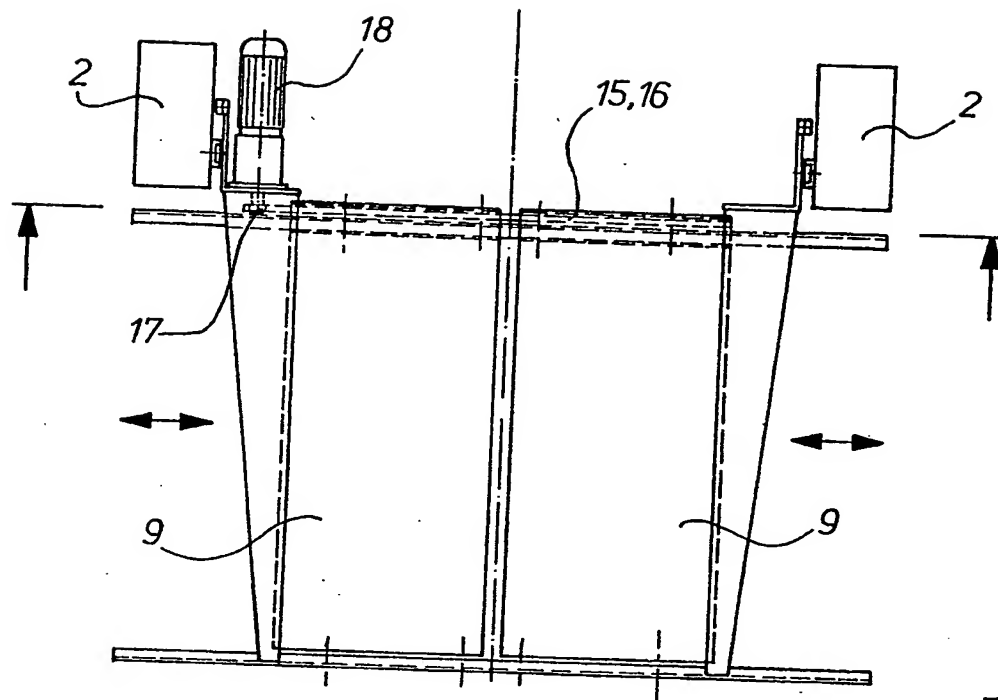


Fig. 4

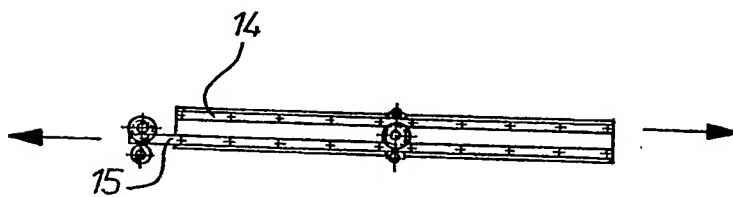


Fig. 5

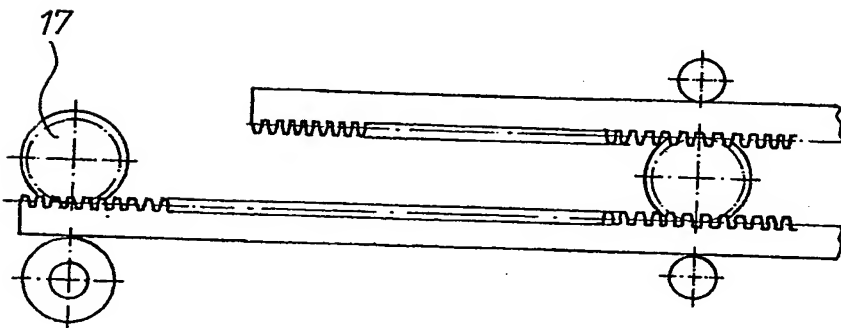


Fig. 6

## SPECIFICATION

### Apparatus for loading pallets with piece goods

- 5 The present invention relates to an apparatus for loading pallets with piece goods, comprising a pallet loading position, a piece goods collection position and, above such positions, a support plane which is displaceable in a vertical direction.
- 10 Apparatuses for loading and unloading pallets are known which have a gripper head. This head is adapted to be reciprocated between pallet loading or unloading positions and a piece goods collection or dispersion position. Other pallet loading apparatuses are known in which the gripper head is replaced by support planes. The gripper head apparatuses are preferably utilised for moving accurately formed piece goods which additionally are provided with apertures into which the grippers are inserted.
- 15 An example of such piece goods would be bottle crates. Apparatuses having a displacement plate are employed when cartons or other piece goods having no means for receiving the grippers are to be moved, when the piece goods are to be located in differing layouts or when they are to be stacked one above the other. It is therefore necessary to provide different types of apparatus for different uses. Loading machines having a displacement plate preferably have a pallet lifting member as the support plane.
- 20 The present invention seeks to provide an apparatus in which conventional pallet lifting platforms having support planes and a displacement or transfer plate displaceable between a pallet loading position and a piece goods collection position are no longer necessary. By so doing, it is possible to use a mechanical assembly unit comprising a basic frame as well as a displacement plate or an endless chain of rods as the support plane and a reciprocable displacement member whilst still maintaining the means necessary for the transportation of the piece goods and the pallet and for the lifting device.
- 25 In accordance with the present invention, there is provided an apparatus for loading pallets with piece goods comprising a pallet loading position, a piece goods collection position and a support plane located above said loading position, which plane is capable of being vertically reciprocated, wherein the support plane is located solely above the pallet loading position and is mounted in a vertically reciprocable manner on a cross-beam located over the pallet loading position, the support plane being divided into two halves, each half being guided along each side on support rails extending at right angles to the direction of transfer of the goods, said halves being displaceable towards and away from one another, and wherein the cross-beam includes a stripper member for preventing movement, in use, of piece goods, whilst said halves are displaced away from one another.
- 30 The support plane may be formed as a divided displacement plate.
- In an alternative embodiment, the support plane may be formed as an endless chain which is displaceable, in two opposite directions at right angles to the direction of layer transfer.

Desirably, each displacement plate half carries a racked bar, which bar co-operates with drive means located externally of the region of displacement of said halves.

- 70 An apparatus in accordance with the invention permits both types of machines to be assembled mechanically from the same components. The divided displacement plate presents the possibility of being able to dispense with double-sided cross-beams, that is to say, with the necessity of the cross-beam being displaceable over both the pallet loading position and over the piece goods collection position and over the piece goods collection position. Furthermore, the apparatus in accordance with the invention does not necessitate the use of conventional pallet lifting devices and a lifting device is provided which may also be used with the employment of a gripper carriage located within the mechanical assembly unit.
- 80 The machine will be further described, by way of example, with reference to the accompanying drawings, in which:
- Figure 1* is a side view of a pallet loading apparatus in accordance with the present invention which has a divided displacement plate as a support plane;
- Figure 2* is a plan view of the apparatus shown in *Figure 1*;
- Figures 3 and 3'* show an alternative embodiment of the apparatus in which the support plane is adapted as a rod chain; and
- Figures 4 - 6* show a simplified elevation of the racked bar drive of the displacement plates.
- In the embodiment shown in *Figure 1*, an apparatus for loading pallets comprises a frame 1, which is provided with upright members 2. On one side of these uprights, a pallet loading position 3 is provided and on the other side thereof, a piece goods collection position 4 is located. Within the uprights 2, a lifting device 5, which is vertically displaceable is provided, which lifting device includes guide members 6. On the internal surface of the members 6, cross-beams 7 are located, which cross-beams only extend over the pallet loading position 3. The cross-beams 7 receive a support plane 8. This plane 8, in the embodiment shown in *Figure 1*, comprises a displacement plate 9. The plate 9 is in two halves which are each guided in support rails 11, the support rails being provided on each side of each half and extend at right angles to the direction of transfer. The cross-beams 7 are provided with strippers 12 which are located above the displacement plate halves 9.
- Figure 3* shows an alternative embodiment of the support plane. In this embodiment, the plane comprises a rotating endless chain of rods 13 which is also supported on the support rails 11 for the cross-beams 7. The chain is guided on guide rollers 14 and is driven by drive means, which may be located within the cross-beams 7. To provide an adequately free zone for scraping off a layer of piece goods onto a pallet, the chain has, as shown, a portion which extends upwardly from the depositing region. In accordance with the alternative embodiment of the displacement plates, the chain only

extends over one-half of the actual support plane.

Figure 4 shows a drive arrangement for the displacement plate halves. This comprises racked bars 15 and 16 which are located on each plate half 9 and which co-operate with a drive pinion 17 of a drive motor 18. The flanks of the racked bars face one another, so that the two plate halves can be moved by the drive arrangement towards or away from one another.

- 10 In the pallet loading apparatuses shown, the piece goods are assembled in the region of the collecting position 4 in a desired layout and are displaced onto the support plane by means of a device not shown. As soon as a complete layer has been received, the lifting device 5 is actuated to cause the cross-beams 7 to move downwardly, the layer of piece goods is then deposited onto a prepared pallet 17. The displacement plate halves 9 or the chains 13 are then displaced outwardly so that the layer of goods is supported only by the pallet 17. Subsequently, the support plane is returned to its starting position to receive a new layer of piece goods which has already been prepared in the collecting position 4. This operation can then be repeated until a pallet has been loaded to a required level.

#### CLAIMS

1. An apparatus for loading pallets with piece goods comprising a pallet loading position, a piece goods collection position and a support plane located above said loading position, which plane is capable of being vertically reciprocated, wherein the support plane is located solely above the pallet loading position and is mounted in a vertically reciprocable manner on a cross-beam located over the pallet loading position, the support plane being divided into two halves, each half being guided along each side on support rails extending at right angles to the direction of transfer of the goods, said halves being displaceable towards and away from one another, and wherein the cross-beam includes a stripper member for preventing movement in use, of piece goods, whilst said halves are displaced away from one another.

2. An apparatus as claimed in claim 1, wherein the support plane is a divided displacement plate.

3. An apparatus as claimed in claim 1, wherein the support plane is an endless chain of rods which is displaceable in two opposite directions at right angles to the direction of layer transfer.

4. An apparatus as claimed in claim 2, wherein each displacement plate half carries a racked bar, which bar co-operates with drive means located externally of the region of displacement of said halves.

5. An apparatus for loading pallets constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.